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TOWNSEND and TOWNSEND and CREW LLP

By: /Aurora Lowell/

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PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Zheng Yuan, *et al.*

Application No.: 10/757,771

Filed: January 14, 2004

For: NITROUS OXIDE ANNEAL OF
TEOS/OZONE CVD FOR IMPROVED
GAPFILL

Customer No.: 57385

Confirmation No. 5494

Examiner: William M. Brewster

Technology Center/Art Unit: 2823

AMENDMENT UNDER 37 CFR 1.116
EXPEDITED PROCEDURE EXAMINING
GROUP 2823

Mail Stop **AF**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Final Office Action mailed May 23, 2006 on the above-referenced application, please enter the following amendments and remarks:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 4 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method of filling a gap defined by adjacent raised features on a substrate, comprising:
 - providing a flow of a silicon-containing processing gas to a chamber housing the substrate;
 - providing a flow of an oxidizing gas to the chamber;
 - depositing a first portion of a film as a substantially conformal layer in the gap by causing a reaction between the silicon-containing processing gas and the oxidizing gas, wherein depositing the conformal layer comprises varying over time a ratio of the (silicon-containing processing gas):(oxidizing gas) and regulating the chamber to a pressure in a range from about 200 torr to about 760 torr throughout deposition of the conformal layer;
 - thereafter, depositing a second portion of the film as a bulk layer, wherein depositing a second portion of the film comprises maintaining the ratio of the (silicon-containing processing gas):(oxidizing gas) substantially constant throughout deposition of the bulk layer and regulating the chamber to a pressure in a range from about 200 torr to about 760 torr throughout deposition of the bulk layer; and
 - thereafter, exposing the substrate to nitrous oxide at a temperature less than about 900°C to anneal the deposited film.
2. (Original) The method of claim 1, wherein exposing the substrate to nitrous oxide at a temperature less than about 900°C to anneal the deposited film comprises exposing the substrate to nitrous oxide at a temperature less than about 750°C to anneal the deposited film.
3. (Original) The method of claim 1, further comprising thereafter planarizing the film.
4. (Original) The method of claim 3, wherein planarizing the film comprises subjecting the film to chemical mechanical polishing.

5. (Previously Presented) A method of forming isolation structures in a silicon substrate, comprising:

- etching trenches in the substrate;
- providing a flow of a silicon-containing processing gas to a chamber housing the substrate;

- providing a flow of an oxidizing gas to the chamber;
- causing a reaction between the silicon-containing processing gas and the oxidizing processing gas to form a silicon oxide layer at least in part by:

- depositing a first portion of a film as a substantially conformal layer in the trenches by causing a reaction between the silicon-containing processing gas and the oxidizing gas, wherein depositing the conformal layer comprises varying over time a ratio of the (silicon-containing processing gas):(oxidizing gas) and regulating the chamber to a pressure in a range from about 200 torr to about 760 torr throughout deposition of the conformal layer; and

- thereafter, depositing a second portion of the film as a bulk layer, wherein depositing a second portion of the film comprises maintaining the ratio of the (silicon-containing processing gas):(oxidizing gas) substantially constant throughout deposition of the bulk layer and regulating the chamber to a pressure in a range from about 200 torr to about 760 torr throughout deposition of the bulk layer;

- heating the substrate in the presence of nitrous oxide; and
 - thereafter, planarizing the layer.

6. (Original) The method of claim 5, wherein planarizing the layer comprises subjecting the layer to chemical mechanical polishing.

7. (Canceled)

8. (Previously Presented) The method of claim 5, wherein heating the substrate in the presence of nitrous oxide comprises exposing the substrate to nitrous oxide at a temperature less than about 900°C to anneal the deposited film.

9 - 23 (Canceled)

REMARKS/ARGUMENTS

Claims 1-6, 8-13, 17-20 and 23 were pending in this application. No claims have been amended or added. Claims 9-23 have been canceled. Hence, claims 1-6 and 8 remain pending after entry of the amendments herein. Reconsideration of the subject application as amended is respectfully requested.

Claims 9, 10 and 17-19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the cited portions of U.S. Patent No. 5,474,955 to Thakur, *et al.* (hereinafter "Thakur").

Claims 11-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Thakur as applied to claims 9, 10 and 17-19, and further in view of the cited portions of U.S. Patent No. 6,239,002 to Jang, *et al.* (hereinafter "Jang").

All unallowed claims have been canceled.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,

Dated: July 17, 2006

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